occur when the N.P.D. of the sun was neither great nor small, but midway between the two extremes. These facts will be made clearer by the accompanying woodcuts, in which the globes are shown in four different positions. Fig. 45 represents cases 1 and 3, and Fig. 46 cases 2 and 4. In Figs. 47 and 48 these facts are shown in different ways: Fig. 47 represents the aspect of the earth as seen from the sun at the summer solstice, when it will be seen that England is seen to lie near to the centre of the hemisphere; while in Fig. 48, representing the conditions at the winter solstice, England is so near the edge that it cannot be properly represented. This experiment then will enable us to go further, and to say that the plane of the earth's equator, and therefore of the earth's spin, is not parallel to the plane of the ecliptic, but is inclined to it at an angle represented by the difference between 90° and 66°, or 90° and 113°; that is to say, the angle between these two planes, that of the earth's rotation and that of its revolution, is something like 23°.

In the non-coincidence of these two planes we have one of the most fundamental points in astronomy, for the reason that what Greenwich is to earth measurement the point of intersection of these two planes is to heaven measurement. The result of this inclination of these two planes is that at one particular point in its course round the sun the equatorial plane of the earth seems to plunge below the plane of the ecliptic, whilst at another and an opposite point it seems to come up from below that plane.

These two points are known as the nodes of the orbit, the ascending node at that point where the earth comes up from below, the descending node when it is plunging down from above. It will be remembered that when the question of terrestrial longitude was occupying our attention it was pointed out that it might begin anywhere: we begin at Greenwich, the French prefer Paris, the Americans Washington, and so on. With regard to celestial longitude, although it also might begin anywhere, yet there is a general agreement among astronomers that the right ascension of stars shall be counted from this ascending node, or, as it is otherwise called, the first point of Aries, where we get the intersection of the earth's plane of rotation with the ecliptic plane of revolution. That is the start-point not only of right ascension for the stars, but of celestial longitude, because it is necessary that we should have a means of determining the positions of stars, not only with reference to the plane of the earth's rotation, but with reference to the plane of the ecliptic itself, and the number of degrees which a heavenly body is observed above or below that plane (such degrees being called degrees of celestial latitude) require to be known in order to determine absolutely the position of any star. With the transit instrument and the sidereal clock the precise angle of intersection of these planes is determined, but it is necessary to know also the precise point in the orbit at which the intersection takes place, before we can use either our transit instrument or our clock for the determination of the precise position of a heavenly body. And now that so much has been said, we can go further with regard to our sidereal clock, and say that it shows oh. om. os. when the first point of Aries is exactly on the central wire of the transit instrument, and that it will come back to that time, oh. om. os., after an interval of twenty-four hours. In that way, by discussing the point of the intersection of the planes, we come to the conclusion not only that the earth's axis is inclined 23½° to the ecliptic plane, but that we have at that point the most convenient starting point both for the right ascension of stars as determined by a sidereal clock, and the longitude of stars, if we choose to define their positions with reference to the ecliptic plane, instead of with reference to the plane of the earth's rotation. It is curious how in dealing with these matters we find that phenomena apparently the most diverse are really bound up in a most intimate connection with each other. In further considering the subject it will be seen that not only do we get these precious start-points from these considerations, but that they bring before us questions of the greatest interest and value to all earth-dwellers, questions that enable us accurately to study not only time as applied to the dealing out of our days and nights, as applied to those changes which take place during the year, as applied to those changes which effect the years themselves, but as applied to those yet greater changes which have probably been going on in this planet of ours for very many millions of years.

J. NORMAN LOCKYER

(*To be continued.*)

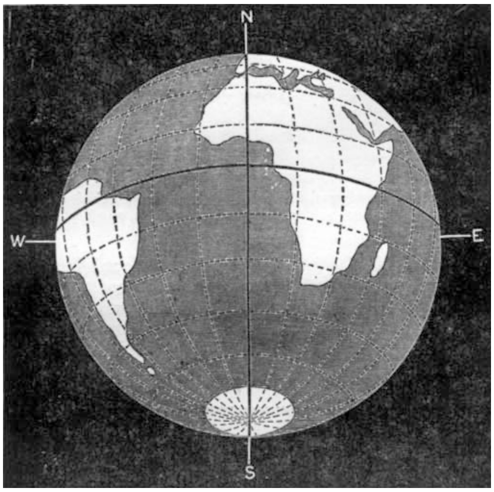

FIG. 48.—The earth, as seen from the sun at the winter solstice (noon at London).

## *ZOOLOGICAL NOMENCLATURE*

ON Tuesday last week a meeting was held in the Lecture Room of the Natural History Museum, where a number of leading British zoologists assembled to meet Dr. Elliott Coues, who is now on a visit to this country, and to hear from him an exposition of the views advocated by himself and the leading American zoologists with regard to the adoption of Trinomial Nomenclature.

Among those present were representatives of many branches of science, and we noticed the following British naturalists:—Lord Walsingham, Prof. Flower, F.R.S., Dr. Günther, F.R.S., P. L. Sclater, F.R.S., Dr. H. B. Woodward, F.R.S., Prof. Traquair, F.R.S., W. T. Blanford, F.R.S., Henry Seebohm, F.L.S., Howard Saunders, F.L.S., Prof. F. Jeffrey Bell, J. E. Harting, F.L.S., G. A. Boulenger, H. T. Wharton, F.L.S., S. O. Ridley, F.L.S., W. F. Kirby, Sec. Ent. Soc., Herbert Druce, F.L.S., W. R. Ogilvie Grant, and R. Bowdler Sharpe, F.L.S.

The chair was taken at 3 p.m. by Prof. Flower, F.R.S., the Director of the Natural History Museum, who briefly opened the proceedings by reading a letter from Prof. Huxley, P.R.S., expressing his great regret at not being able to be present, being prevented by pressure of official business.

The Chairman said:—The subject we have met to discuss is one of extreme importance as well as difficulty to zoologists, for though in so many respects the name attached to any natural object is the most trivial and artificial of any of its attributes, and may hardly be thought worthy of scientific consideration, laxity in the use of names causes endless perplexities and hindrances to the progress of knowledge. I must confess that I feel some sympathy with the young lady, lately quoted in a speech by Sir John Lubbock at the University of London as an instance of hopeless stupidity, who, after listening to a lecture on astronomy, said she had no difficulty in understanding how the distances, motions, and even chemical composition of the stars were discovered, but what puzzled her was how their names were found out. Now, I have often had little difficulty in making out the characters and structure of an animal, and even the functions of some of its organs, but when I have to decide by what name to call it, I am often landed in a sea of perplexity. Yet those of us who work in museums are constantly engaged in cataloguing and labelling, and we are supposed to be able at once to give the correct name to every creature in the collection. I hope that this discussion will help to clear up our ideas upon the subject. With the impartiality due from the chair, I shall not give any opinion upon the merits of the rival schemes to be proposed, at all events not until after hearing the arguments to be brought forward for or against them, and I cannot say that I am very sanguine of being able to do so then. I now call upon Mr. R. Bowdler Sharpe to read a paper "On the expediency, or otherwise, of adopting Trinomial Nomenclature in Zoology."

Mr. Sharpe then read his paper:—I approach the discussion of this subject without the least prejudice either for or against the adoption of trinomial nomenclature. It has been for some time recognised and allowed by zoologists on the other side of the Atlantic, and to a certain extent the principle has been admitted by more than one worker in the Old World, but the presence in this country of one of the most able advocates of the system in the person of that distinguished American zoologist, Dr. Elliott Coues, has recently stimulated the thoughts of many of us as to the wisdom of its adoption for the zoology of the Old World, and it occurred to me that a friendly meeting to discuss the matter with Dr. Coues and some of our leading British zoologists could certainly do no harm, and might be productive of a considerable amount of good. Understanding from Dr. Coues that he would not object to attend a small conference of zoologists on this subject if we desired to talk over the matter, I appealed to many of the latter to appear to-day, and I think that this gathering of British naturalists, under the presidency of our esteemed director, Prof. Flower, is sufficient to show that that there is a considerable amount of keen interest felt in the solution of the question.

It is now more than ten years ago that Dr. Coues, in his "Key to the North American Birds," first began to adopt the trinomial nomenclature which is now so generally accepted by American ornithologists. But until quite recently both he and his coadjutors have been in the habit of inserting the word *var.* before the sub-specific name. At present, however, the system which he adopts is trinomialism pure and simple, and this is shown in the second edition of his "Key," which has just appeared.

Now I can only speak as an ornithologist, and my views must be regarded as purely personal; but I do think that it is good for zoologists in general to learn from the lips of Dr. Coues exactly what the system is which he proposes to adopt for ornithology, and to what lengths it would lead us. I shall listen with attention and respect to the remarks with which any of my colleagues learned in other branches of zoology may favour us this afternoon.

It seems to me that there are certain facts in nature which we all of us recognise as facts, but about the expression of which many of us entertain different views. I propose merely to place before you certain difficult aspects of the question as they present themselves to me, and I shall be glad to have an expression of opinion upon the facts which I bring forward. I would therefore crave permission for a few moments to run over some of the published volumes of the "Catalogue of Birds," and to discuss some changes of nomenclature that might be involved if the trinomial system were to be adopted in a second edition of that work. It will be noticed that in 1874 I recognised the existence of "sub-species" among the *Accipitres*, and I now lay on the table one of the most interesting examples of what I conceive to be a series of sub-species, or representative races, of one dominant form. In Southern Africa we have a small Goshawk called *Astur polyzonoides*, which inhabits the whole of the South African sub-region, but does not, so far as my knowledge goes, extend beyond the Zambesi. In Senegambia and North-East Africa it is replaced by a race called *Astur sphenurus*, in which the colour of the under-surface is much more delicate than in *Astur polyzonoides*. From Central Russia, throughout Turkey, Asia Minor, Persia, and Syria, a large race called *Astur brevipes* replaces the two foregoing sub-species, and forms a third. From Baluchistan, throughout India, and Ceylon, a somewhat smaller form, *Astur badius*, takes up the running, and throughout the Burmese countries, extending to Formosa and Hainan, we have yet another race, *Astur poliopsis*, which is a purer and more elegantly coloured edition of *Astur badius*. This little group of Goshawks has been well worked out, and we may fairly presume that we have the facts before us. Now I should like to know if this is a case where we might adopt the trinomial system, and call these birds

*Astur badius,*
*Astur badius poliopsis,*
*Astur badius brevipes,*
*Astur badius sphenurus,*
*Astur badius polyzonoides.*

At present, were I writing about the South African bird or the Abyssinian bird, I should never speak of them as *Astur badius*, which is the name belonging to the Indian bird exclusively, and I am not quite sure that we gain in this case anything whatever by adopting trinomial nomenclature. The same parallel may be drawn with some of the species of *Scops* among the Owls, as may be seen by the series now exhibited, and here trinomial nomenclature might perhaps be employed. Thus the representative races of *Scops giu* would be *S. giu capensis* in Africa, *S. giu pennatus* from the Himalayas, *S. giu minutus* from Ceylon, *S. giu stictonotus* from China, *S. giu japonicus* from Japan, *S. giu malayanus* from Malacca, *S. giu rufipennis* from Madras, and *S. giu brucii* from North-Western India.

In the third volume of the "Catalogue" I have again freely admitted "sub-species," as, for instance, with some Crows, *e.g. Corone macrorhyncha* from the Sunda Islands, replaced in India and China by *C. levaillantii*, which extends to Eastern Siberia, but is further replaced in Japan by a large race—*C. japonensis*. In this instance I believe that the trinomial nomenclature could be employed with advantage, for if we spoke of *C. macrorhyncha japonensis* or *C. macrorhyncha levaillantii*, it would convey to us an absolutely definite idea, viz. that these were merely forms of the typical *C. macrorhyncha* with a distinct geographical area assigned to each.

To take another case of a different kind. I place on the table several species of *Chibia* from the Malay Archipelago, and the difficulty which anybody would find at first sight in the separation of these Moluccan Drongos can be explained off-hand by the fact that they are nothing more nor less than representative insular forms of one dominant species. If, therefore, you speak of these birds as *Chibia carbonaria* from the Papuan group of islands, represented by *C. carbonaria assimilis* in the Aru Islands, by *C. carbonaria amboinensis* in Ceram and Amboina, and again by *C. carbonaria atrocærulea* in Batchian and Gilolo, I contend that these names, although long, convey an exact impression of the value of these forms, which are so closely allied as to be almost indistinguishable. A more difficult question arises when we come to treat of the Yellow Wagtails, concerning which, curiously enough, there has been quite a consensus of opinion among some of the German ornithologists that they ought to be treated trinomially. Thus in the "Vögel Ost-Afrikas," by Drs. Finsch and Hartlaub, we find these birds spoken of as *Motacilla flava melanocephala*, &c., and the same phraseology is adopted by Baron von Heuglin in the "Ornithologie Nord-ost Afrikas." Having recently studied these birds, I can only say that I think the employment of trinomial nomenclature by these authors was somewhat premature, inasmuch as, from the showing of the writers themselves, these birds to which they gave trinomial names are not only migratory, but have well-defined geographical areas of distribution. I myself consider that the intermediate forms which undoubtedly exist are due to another and totally different cause, viz. to hybridisation, inasmuch as many of these birds occupy nearly the same winter areas in Africa, and doubtless many of them pair with birds of an allied form on their return to Europe. Thus *Motacilla kaleniczenkii*, which is *M. melanocephala* with a white eyebrow, is probably (although there is no proof of the fact) the latter species with a strain of the white-eyebrowed *M. flava* admixed, as both *M. kaleniczenkii* and *M. melanocephala* occur together.

There is one advantage which we must all admit that the American zoologists possess over ourselves, and that is, that they have a clear idea of the natural geographical divisions of their continent, and their zoology has been studied from many distinct points of view, such as the presence or absence of rainfall, &c., and it only requires a glance at Mr. Hume's essay on the distribution of Indian birds with respect to the distribution of rainfall throughout the Indian peninsula to see how very important is this aspect of the subject. Even in the British Islands there are variations in the size and coloration of some of our resident birds, as any one may learn from Mr. F. Bond, who has devoted sixty years of his life to the study of British ornithology, and who now has one of the most interesting collections in this country. But when we come to study the birds of Europe and the Palæarctic region generally, how small is our real knowledge, and what vast areas are there concerning the ornithology of which we know next to nothing! Great praise is, therefore, due to men like Dr. Menzbier, who has just written the first part of an elaborate treatise on the geographical distribution of birds in Russia; but it will be a long time before we can have in any museum such a series of birds as is possessed by the Smithsonian Institution for any one wishing to study the geographical distribution of the birds of North America. The British Museum is fully alive to the importance of the question, but I find that there is nothing more difficult than to procure from my colleagues in the other countries of Europe a representative set of the common resident birds of their respective countries. The value of such collections as that which Mr. Seebohm is making cannot be over-estimated.

I have exhibited to-day three distinct illustrations of birds from the Old World where trinomial nomenclature might be employed. In the case of the Goshawks, the Scops Owls, and the Crows, I am not yet certain that my way of treating them in the "Catalogue" as sub-species is not as advantageous as the employment of trinomials. But in the case of the Long-tailed Titmice the circumstances seem to me different, and the adoption of trinomial nomenclature would be a positive advantage, because *Acredula caudata* undoubtedly mixes with *A. rosea* in the Rhine provinces and other parts of Europe; therefore in England, where the *rosea* strain is apparently pure and unmixed, it is advantageous to speak of the bird as *Acredula caudata rosea*, because such a name clearly conveys the idea that *A. rosea* is a form of *A. caudata*, with which it is connected by intermediate forms elsewhere. *A. caudata irbii* would also express the relationship of the South European bird, and *A. caudata trivirgata* the Japanese form.

The case of the Wagtails is not so clear, because we do not yet seem to have sufficient material to work upon. Even here some of the races might be fairly expressed by the employment of trinomials, as *Motacilla flava dubia* for the Siberian and Indian race of *M. flava*. *M. viridis* being a form without an eyebrow, would have a Mediterranean race, *M. viridis cinereocapilla*, while *M. melanocephala* has at least one race, *M. melanocephala kaleniczenkii*, unless the last-named ultimately proves to be a hybrid.

I may say in conclusion that the great difficulty which I perceive in the adoption of trinomial nomenclature, both at home and abroad, lies in the fact that it will open the door to a multiplication of species, or races, founded on insufficient materials, and bestowed by authors who have not sufficient experience of the difficulties of the subject; but I cannot conceal from myself that the code of nomenclature proposed by the British Association and followed by most of us scarcely accounts for the treatment of facts as they have been developed in zoological science since the promulgation of that code, and that before long it will be the duty of British zoologists to attempt its modification.

Mr. Henry Seebohm read the following paper:—The question of a binomial or trinomial nomenclature is not a very simple one. So long as ornithologists were under the delusion that all species were separated from each other by a hard and fast line, the binomial system of nomenclature was sufficient. Now that we know that many forms which have been regarded as species are connected by intermediate links with each other, and that many species present important local variations which cannot be ignored, we are obliged to admit the existence of sub-species as well as species. There can be no doubt that the too tardy recognition by European ornithologists of what might not unreasonably be regarded as the most important fact in ornithology discovered during the present century has been very largely due to a pedantic adherence to a binomial system of nomenclature. Now that we have emancipated ourselves from the fetters with which our predecessors, with the best intentions in the world, cramped our ideas, the question arises, how shall we recognise in our nomenclature the existence of sub-specific forms; by a word, or by a sentence? The ornithologists of America think that a system of trinomial nomenclature will answer the purpose. They have come to the conclusion that the insertion of a third link in the chain which binds us will give our ideas scope enough. Their theory is that the judicious ornithologist will be able to select from the infinite number of steps which form the series of intermediate races which lie between two intergrading species, one, two, three, or even in some cases more local or climatic races which are worthy of being dignified by a name. This theory is on the face of it somewhat illogical. It credits ornithologists with an amount of discretion which their past history does not justify, and totally ignores the inordinate desire to introduce new names which is unfortunately too conspicuous in most if not in all ornithological writers, culminating in the absurdities of a Brehm. That ornithology should be preserved from being Brehmised must be the devout prayer of every well-wisher of the science. On the other hand, the recognition of sub-species by a sentence would be to revert to the customs of the præ-Linnean dark ages of nomenclature, a retrograde step from which all zoologists would instinctively shrink. Members of the British Ornithologists' Union are probably all prepared to admit that a medium course is safest at least for an Ibis (*medio tutissimus ibis*), and, with a very slight modification, I for one am prepared to adopt the American system in spite of its dangers. If no paths are to be trodden in which the indiscreet may err, there is an end at once of all progress.

To point out the modifications which I propose to introduce into the American system of nomenclature to change it from an empirical system to a logical or scientific system, I will take as an example the Common Nuthatch (*Sitta europæa*) and show how the nomenclature of its various races may be made exhaustive, so that the temptation to introduce new names, which appears to be irresistible to the indiscreet ornithologist, may be minimised.

*Sitta uralensis*, with white under parts, is found in Siberia; *Sitta cæsia*, with chestnut under parts, is found in England; intermediate forms connecting these species together are found in the Baltic provinces. What can be more simple than to call the intermediate forms by both names, *Sitta cæsia-uralensis*? But there is a third species which turns up in China, *Sitta sinensis*, and which is also connected with *Sitta uralensis* by intermediate forms. Never mind; they too can be called by both names, and our series of Nuthatches runs geographically in an unbroken series:—

*Sitta cæsia*,
*Sitta cæsia-uralensis*,
*Sitta uralensis*,
*Sitta uralensis-sinensis*,
*Sitta sinensis*.

So far so good; but, unfortunately, two more complications arise. Besides the series running south-west into *S. cæsia*, and that running south-east into *S. sinensis*, two other series run from the central form *S. uralensis*, one running due west and then round by the Baltic into the Scandinavian *S. europæa* (a larger bird, and somewhat darker on the under parts), and a second running due east and then round the Sea of Okotsk into the Kamchatkan *S. albifrons* (a bird much paler on the head, which shades into white on the forehead), so that it is necessary to add four more names to the list, which will stand as under:—

*Sitta cæsia* is found in Britain, South-West and South Europe, and Asia Minor. It is medium in size, but extreme in the darkness of the chestnut of the under parts.

*Sitta cæsia-uralensis* (with a hyphen between the two specific names) represents all the forms intermediate between South European and Siberian examples, which occur in Denmark, Pomerania, the Baltic provinces of Russia, Poland, and the Crimea.

*Sitta europæa* is the Scandinavian form, and represents the extreme of size, whilst in colour it is intermediate between the forms found in the Baltic provinces of Russia and Central Siberia.

*Sitta europæa-uralensis* comprises all the intermediate forms in Russia which connect the Scandinavian with the Central Siberian forms.

*Sitta uralensis* is found in the valleys of the Ob, the Yenesei, and the Lena, and combines the small size characteristic of the various Asiatic sub-species of Nuthatch with the dark upper parts of the sub-tropical forms, whilst the under parts are nearly as white as in the Kamchatkan form.

*Sitta uralensis-albifrons* may be applied to all those intermediate forms found in East Siberia and the north islands of Japan which are not quite so pale on the upper parts as the Kamchatkan form.

*Sitta albifrons* is found in Kamchatka, and represents the extreme form so far as whiteness of the forehead and under parts is concerned.

*Sitta uralensis-sinensis* may be applied to the series of forms found in the valley of the Amoor, the island of Askold, and the main island of Japan. They are intermediate in colour between the Central Siberian and Chinese forms, and are scarcely to be distinguished from the Baltic province forms.

*Sitta sinensis* is found in China, and only differs from the British form in being slightly smaller and in not having quite so much dark chestnut on the flanks.

I have purposely chosen a complicated case in order to show the capabilities of the system, which, if the specific name of *europæa* is always repeated after the generic name of *Sitta*, becomes a compromise between that adopted by the Americans and that which I imperfectly carried out in the fifth volume of the "Catalogue of Birds in the British Museum," and which was originally suggested to me by a conversation with Mr. Salvin. It has at least the merit of being exhaustive, and differs so slightly from that in common use in America that its adoption does not involve a change in, but only an addition to, the system which in some form or other is destined to supersede the binomial system now rendered inadequate by the acceptance of the theory of evolution.

As an example of the compromise I propose, I add a list of the local races of the Dipper, with their geographical ranges:—

*Cinclus aquaticus melanogaster* (Scandinavia).

*Cinclus aquaticus melanogaster-albicollis* sive *Cinclus aquaticus* (West Europe, as far north as the Carpathian and as far south as the Pyrenees).

*Cinclus aquaticus albicollis* (South Spain, Algiers, Italy, Greece).

*Cinclus aquaticus albicollis-cashmiriensis* (Asia Minor, Caucasus, Persia).

*Cinclus aquaticus leucogaster* (East Siberia).

*Cinclus aquaticus leucogaster-cashmiriensis* (Central Siberia).

*Cinclus aquaticus cashmiriensis* (Cashmere, South Siberia, and Mongolia).

*Cinclus aquaticus cashmiriensis-sordidus* (Altai Mountains).

*Cinclus aquaticus sordidus* (Thibet).

In this system it must be observed that wherever there is a fourth name it is always connected by a hyphen to the third name, and comprises all the intermediate forms between the two. It is somewhat cumbrous, but it provides for the contingency of any intermediate links that may occur. To express it algebraically, it provides not only for A B and B C, but also for A C. It is perhaps the only system which is theoretically perfect, but the question whether its voluminousness renders it impracticable or undesirable is one requiring careful consideration.

(*To be continued.*)

## *UNIVERSITY AND EDUCATIONAL INTELLIGENCE*

UNIVERSITY COLLEGE, BRISTOL.—A correspondent writes:—This session has been most successful, the numbers of students in attendance being considerably larger than in the two preceding years. Funds are wanted more seriously than ever to complete the building and provide additional accommodation. Nothing has yet been done towards an endowment fund. Mr. E. Buck, M.A., Lecturer in Mathematics, has resigned his position on the staff. The Demonstrator in Physics, Mr. Colman C. Starling, has also resigned his post in consequence of internal rearrangements. The Chair of Geology and Physiology, left vacant by the resignation of Prof. Sollas, has been filled by the appointment of Mr. Lloyd Morgan.

## *SOCIETIES AND ACADEMIES*

### SYDNEY

**Linnean Society of New South Wales**, April 30.—Dr. James C. Cox, F.L.S., vice-president, in the chair.—The Hydromedusæ of Australia, part 2, by R. von Lendenfeld, Ph.D. According to the principles set forth in part 1 of this paper, the Hydromedusæ are classified in a new manner, and the Australian representatives of the first four families in this system are described or referred to. The paper contains descriptions of several new and interesting forms, and in every case an abstract of everything known on the histology of every species is given with references. The most interesting of the new forms is *Eudendrium generale*, the male polypastyles of which show a great similarity to Medusæ. They possess four aboral tentacles in the principal radii, and on these the spermatozoa reach maturity. These tentacular appendages are therefore homologous to the radial canals of the Craspedote Medusæ. Some deductions are drawn herefrom, and the homology of the parts in Medusæ and Polypes described differently to the views expressed by Allman and others. The Umbrella is not homologous to a web between the tentacles of the mouth, but between the generative tentacular processes at the aboral pole.—Revision of the recent Rhipidoglossate and Docoglossate Mollusca of New Zealand, by Prof. F. W. Hutton, F.G.S. The synonymy of all the species is fully given, with, in many instances, revised descriptions and notes on the dentition where known.—Notes on hybridism in the genus Brachychiton, by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph.D., F.R.S., &c. The plant which is the subject of this paper is a beautiful tree of forty feet in height and a stem diameter of one foot, grown at Fern Hill, near Penrith, New South Wales, and is an undoubted hybrid between *Brachychiton populneum* and *Brachychiton acerifolium*. Like most hybrids, the flowers never perfect their seed.—Mr. Macleay read a letter from the Rev. J. E. Tenison-Woods, vice-president of the Society, dated from Perak, February 27 last, giving a long and interesting acount of his proceedings and experiences in the Malacca Peninsula. He had examined and reported on the rich tin mines of the settlement, and the geological features of the whole territory; and he had spent some time in the investigation of its zoological and botanical productions.

**Royal Society of New South Wales**, May 7.—Annual Meeting.—Hon. Prof. Smith, C.M.G., president, in the chair.—The Report of the Council stated that thirty new members had been elected during the year, and the total number on the roll, April 30, was 494. M. Louis Pasteur, M.D., of the French Academy of Sciences, had been elected an honorary member in the place of the late Dr. Charles Darwin, and Ottokar Feistmantel, M.D., Palæontologist to the Geological Survey of India, had been elected a corresponding member.—The Clarke Medal for the year 1884 had been awarded to Alfred R. C. Selwyn, LL.D., F.R.S., in recognition of his scientific labours in Great Britain and as Director of the Geological Surveys of Canada and of Victoria.—During the year the Society held nine meetings, at which the following papers were read, viz.:—Presidential Address by Chr. Rolleston, C.M.G.—On the aborigines inhabiting the great lacustrine and riverine depression of the Lower Murray, Lower Murrumbidgee, Lower Lachlan, and Lower Darling, by P. Beveridge.—On the Waranamatta shales, by the Rev. J. E. Tenison-Woods, F.G.S., F.L.S.—Further remarks on Australian Strophalosiæ, and description of a new species of Aucella from the Cretaceous rocks of North-East Australia, by R. Etheridge, jun., F.G.S.—On plants used by the natives of North Queensland, Flinders, and Mitchell Rivers, for food, medicine, &c., by E. Palmer (M.L.A. Queensland).—Notes on the genus Macrozamia, with descriptions of some new species, by Charles Moore, F.L.S., V.P.—A list of double-stars, by H. C. Russell, B.A., F.R.A.S.—Some facts connected with irrigation, by the same.—On the discoloration of white bricks made from certain clays in the neighbourhood of Sydney, by E. H. Rennie, M.A.—On the roots of the sugar-cane, by Henry Ling Roth, F.M.S.—On irrigation in Upper India, by H. G. McKinney, A.M.I.C.E.—On tanks and wells of New South Wales; water-supply and irrigation, by A. Pepys Wood.—Additions to the census of the genera of plants hitherto known as indigenous to Australia, by Baron F. von Mueller, K.C.M.G., F.R.S., &c.—The Medical and Microscopical Sections held regular monthly meetings. At the preliminary meeting of the Medical Section this year, the Chairman stated that never during the history of the Section had its meetings been so numerously attended, and that the value of the papers read before it was attested by the fact that so many of them had been reprinted in the Home journals.—The Council has issued the following list of subjects, with the offer of the Society's bronze medal and a prize of 25*l*. for each of the best researches, if of sufficient merit:—Series III. To be sent in not later than September 30, 1884. No. 9. Origin and mode of occurrence of gold-bearing veins and of the associated minerals. No. 10. Influence of the Australian climate in producing modifications of diseases. No. 11. On the Infusoria peculiar to Australia. No. 12. On water-supply in the *interior* of New South Wales. Series IV. To be sent in not later than May 1, 1885. No. 13. Anatomy and life history of the Echidna and Platypus. No. 14. Anatomy and life-history of Mollusca peculiar to Australia. No. 15. The chemical composition of the products from the so-called kerosene shale of New South Wales. Series V. To be sent in not later than May 1, 1886. No. 16. On the chemistry of the Australian gums and resins.—The Chairman read the Presidential Address, and the officers and Council were elected for the ensuing year.

### PARIS

**Academy of Sciences**, June 30.—M. Rolland, President, in the chair.—Remarks on the hygrometric reports from nearly a hundred French stations, yearly published by M. Mascart in the *Annales du Bureau météorologique de France*, by M. J. Jamin.—On the use of formene in the production of very low temperatures, by M. L. Cailletet. The author finds that, when slightly condensed and cooled in boiling ethylene under atmospheric